Translation

PATENT COOPERATION TREATY

PCT/EP2003/007686

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 0000053772	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/EP2003/007686	International filing date (*day/month/year*) 16 July 2003 (16.07.2003)	Priority date (*day/month/year*) 23 July 2002 (23.07.2002)
International Patent Classification (IPC) or national classification and IPC C12N 9/14, 15/82		
Applicant BASF AKTIENGESELLSCHAFT		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

   ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of _____ sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
21 January 2004 (21.01.2004)	26 July 2004 (26.07.2004)
Name and mailing address of the IPEA/EP Facsimile No.	Authorized officer Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/EP2003/007686

I. Basis of the report

1. With regard to the **elements** of the international application:*

☒ the international application as originally filed

☒ the description:

pages 1-49, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

☒ the claims:

pages 1-25, as originally filed

pages _____, as amended (together with any statement under Article 19

pages _____, filed with the demand

pages _____, filed with the letter of _____

☐ the drawings:

pages _____, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

☐ the sequence listing part of the description:

pages _____, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☒ filed together with the international application in computer readable form.

☒ furnished subsequently to this Authority in written form.

☒ furnished subsequently to this Authority in computer readable form.

☒ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* *Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).*

** *Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/EP2003/007686

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application.

☐ claims Nos. _____

because:

☐ the said international application, or the said claims Nos. _____ relate to the following subject matter which does not require an international preliminary examination *(specify)*:

☐ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. _____ are so unclear that no meaningful opinion could be formed *(specify)*:

☐ the claims, or said claims Nos. _____ are so inadequately supported by the description that no meaningful opinion could be formed.

☒ no international search report has been established for said claims Nos. 17-21 (all partly).

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the standard.

☐ the computer readable form has not been furnished or does not comply with the standard.

Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: III.1

1. Cited Documents

D1: LUNN JOHN E ET AL: 'Purification, molecular cloning, and sequence analysis of sucrose-6F-phosphate phosphohydrolase from plants' PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES, Vol. 97, No. 23, 7 November 2000 (2000-11-07), pages 12914-9, November 7, 2000 ISSN: 0027-8424

D2: US-B1-6 323 015 (TARCZYNSKI MITCHELL C ET AL) 27 November 2001 (2001-11-27)

D3: EP-A-1 033 405 (CERES INC) 6 September 2000 (2000-09-06)

D4: WO 01 79514 A (SYNGENTA PARTICIPATIONS AG; JUN JI H (KR); NAM HONG GIL (KR); BAUE) 25 October 2001 (2001-10-25)

D5: LUNN J E: 'Sucrose-phosphatase gene families in plants' GENE: AN INTERNATIONAL JOURNAL ON GENES AND GENOMES, ELSEVIER SCIENCE PUBLISHERS, BARKING, GB, Vol. 303, 16 January 2003 (2003-01-16), pages 187-96, ISSN: 0378-1119.

2.

Claims 17-21 relate to a compound characterized by a desired property, namely its herbicidal effect by inhibiting or blocking SPP. Since the requisite disclosure is lacking, it was not possible to carry out a meaningful search throughout the entire scope.

Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: III.1

The above notwithstanding, the claims also lack the clarity stipulated by PCT Article 6, since the claims attempt to define the method in terms of the result desired in each case.

Therefore, the search was carried only with respect to the portions that appear to demonstrate the requisite clarity, support and disclosure, namely the portions that relate to the antisense oligonucleotides.

The applicant is advised that claims or parts of claims relating to inventions in respect of which no international search report has been established cannot normally be the subject of an international preliminary examination (PCT Rule 66.1(e)). In its capacity as International Preliminary Examining Authority the EPO generally will not carry out a preliminary examination for subjects that have not been searched. This also applies to cases where the claims were amended after receipt of the international search report (PCT Article 19) or where the applicant submits new claims in the course of the procedure under PCT Chapter II.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1,4,8-25	YES
	Claims	2,3,5-7	NO
Inventive step (IS)	Claims	1,8-15,17-23	YES
	Claims	4,16,24,25	NO
Industrial applicability (IA)	Claims	1-25	YES
	Claims		NO

2. Citations and explanations

3.

3.1. Since the priority document was not available at the time of examination, it was assumed that the priority was valid. In the event that this is not the case, document D5 would belong to the prior art.

The application encompasses nucleotide and amino acid sequences of saccharose-6-phosphate phosphatases (alias sucrose phosphatase) of tobacco and potato and their use as targets for herbicides through the expression of antisense oligonucleotides in transgenic plants and transgenic plants that overexpress the claimed enzyme.

3.2. D1 describes the cloning of the saccharose-6-phosphate phosphatases of various plants (page 12915, figure 2, table 3) and their expression in *E. coli*. The described sequence AF283565 of *Arabidopsis thaliana* is approximately 70% identical to the claimed nucleotide sequences and 80% identical to the amino acid sequences and is therefore prejudicial to the novelty of claims 2, 3, and 5-7 (PCT Article 33(2)).

3.3. D3 describes multiple polynucleotide and polypeptide sequences of *Arabidopsis thaliana*, antisense sequences thereof, and their use for plant transformation.

Although certain sequences are highly homologous with the claimed sequences (ID No. 45255 is approximately 70% identical to Sequence ID Nos. 1, 3 and 5 in approximately 1200 nucleotides. See also Sequence ID Nos. 2851, 46240, 7522 and 24600), D3 does not indicate their function. Therefore, the subject matter of D3 is not regarded as prejudicial to the novelty of the claimed enzymes.

3.4. Even if the above-mentioned claims were restricted and therefore novel over the prior art, they still would not be inventive (PCT Article 33(3)). Since the claimed enzyme was already known in other plant species, the cloning of this enzyme in other plant species such as potato or tobacco, the use of this enzyme in standard methods (as described in D3, for example) and the generation of transgenic plants cannot be regarded as inventive.

Therefore, Claims 4, 16, 24 and 25 likewise lack an inventive step (PCT Article 33(3)).

3.5. D4 deals with the same problem as the application, but the target gene is a different one, namely the amino acid glyoxylate aminotransferase. An antisense cDNA library of *Arabidopsis thaliana* is expressed in the plants and the lethal constructs are analyzed. An antisense sequence is thereby isolated from the claimed enzyme, which is regarded as essential for plant growth.

The problem to be solved in view of D4 was that of finding a new target enzyme for herbicides, i.e. an enzyme that is essential for plant metabolism.

D1 describes polynucleotide and polypeptide sequences of SPP. The use of these sequences as a target for herbicides, however, was not mentioned. Therefore, neither D1 nor any of the other prior art documents would have prompted a person skilled in the art to use this specific enzyme as a target.

Consequently, claims 1, 8-15 and 17-23 are novel and inventive (PCT Article 33(3)).

3.6. The subject matter of claims 1-25 is industrially applicable (PCT Article 33(4)).